GOVERNMENT OF ANDHRA PRADESH
ABSTRACT

A.P. State Disaster Response and Fire Services Department - Fire Safety Measures -Construction of buildings up-to 45 Mts. height at Vellore Institute of Technology A.P., (VIT-AP), Ainavolu, Amaravathi, Guntur District – Guidelines - Issued.

HOME (PRISONS & FIRE SERVICES) DEPARTMENT

G.O.RT.No. 327 Dated: 21-03-2019.
Read the following:

1. G.O.Rt.No.87, Home(Prisons &Fire)Department, dated:25.01.2019.
2. From the Director General, State Disaster Response and Fire Services, A.P., Vijayawada, Rc.No.1029/MSB/2018, Dated. 18-02-2019.

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ORDER:

In the letter 1st read above, the Director General, State Disaster Response and Fire Services, Andhra Pradesh, Vijayawada has stated that G.O. 1st read above, Government has permitted the Vellore Institute of Technology (VIT-AP), Ainavolu, Amaravathi, Guntur District, to construct all its Academic Blocks up-to 45 Mtrs., height, subject to taking all necessary precautions for the safety of the structure and the students. Accordingly, the Director General, State Disaster Response and Fire Services, Andhra Pradesh, Vijayawada has constituted a Department Technical Committee under the Chairmanship of Director of Fire Services, Andhra Pradesh, Vijayawada with (03) others.

2. The Departmental Technical Committee, has submitted its detailed report on Fire Safety Measures to be taken in respect of construction of buildings up to 45 Mtrs height at Vellore Institute of Technology (VIT-AP), Ainavolu, Amaravathi, Guntur District.

3. Government after careful examination of the suggestions/report of the Departmental Technical Committee, hereby issue the following guidelines on Fire Safety Measures to be taken in respect of construction of buildings up-to 45 Mtrs height at Vellore Institute of Technology (VIT-AP), Ainavolu, Amaravathi, Guntur District as appended to this G.O., as Annexure.

4. The Director General of State Disaster Response and Fire Services, Andhra Pradesh, Vijayawada, shall take further necessary action accordingly in the matter.

(BY ORDER AND IN THE NAME OF THE GOVERNOR OF ANDHRA PRADESH)

A.R.ANURADHA
PRINCIPAL SECRETARY TO GOVERNMENT

To
The Director General of State Disaster Response and Fire Services,
Andhra Pradesh, Vijayawada.

//FORWARDED::BY ORDER//

SECTION OFFICER

Annexure to G.O.Rt.No.327Home (Prisons & Fire Services) Department dated.21-03-2019. Guidelines on Fire Safety Measures to be taken in respect of construction of buildings up-to 45 mtrs height at Vellore Institute of Technology (VIT-AP), Ainavolu, Amaravathi, Guntur District.

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1. DEFINITION:

1.1 BUILDING : Building means a building of the Height of above 30 Mtrs & up-to 45 Mtrs.

1.2 LAW MEANS : The A.P. Fire Service Act 1999, as amended from time to time or any other law/standard for the time being in force regulating such purpose or activity.

2. MEANS OF ACCESS : The main entrance to the plot shall be of adequate width to allow easy access to the fire engine and in no case shall it measure less than 6 Mtrs., and the head clearance not less than 5 Mtrs.

3. OPEN SPACES:

Open spaces for buildings above 30 Meters height shall be provided as per Table-18 of G.O.Ms.No.119, Municipal Administration and Urban Development (M1) Department, Dated.28.03.2017;

Sl.No	Height of building (in meters)		Minimum abutting road width required (in meters)	Minimum all-round open space on remaining sides (in meters).
	Above	Upto		
1	30	35	24	11
2	35	40	24	12
3	40	45	24	13

4. OCCUPANT LOAD

Clause 4.3 & 4.4 2.1 Part IV of NBC - 2016 or All India Council of Technical Education prescribed norms for calculation of unit exit width.

5. ARRANGEMENT OF EXITS (Clause 4.4.2.2)

a) Fire and Life Safety clause 4.4.2.2 Exits shall be so located that the travel distance on the floor shall not exceed the distance given in Table (5) Part IV of NBC-2016.

b) Travel Distance shall be measured from the most remote point within a storey or a mezzanine floor along the natural and un-obstructed path of horizontal or vertical egress travel to the door to an exit.

c) The dead end corridor length in exit access shall not exceed 6 M for educational, institutional and assembly occupancies.

D) Exits shall be placed as remote from each other as possible and shall be arranged to provide direct access in separate directions from any point in the area served.

5.1 CAPACITIES OF MEANS OF EGRESS(Clause 4.42.1,4.4 2.3 (c) and 4.4, 2.4.2(a)

For example, if an exit doorway measures 1000 mm in clear width it would be defined as providing exit capacity for 1,000/6.5 occupants that is 153 persons (says 150 persons) and number of such exit doorways can then be calculated depending on the occupant load. (or) All India Council of Technical Education prescribed norms.

5.2 INTERNAL STAIRCASES : (Clause 4.4.2.4.3.2 of NBC -2016)

The internal staircases may be constructed with an external wall or otherwise and shall comply with the following:

a) Internal stairs shall be constructed of non combustible materials through and shall have fire resistant rating of minimum 120 Minutes.

b) A staircase shall not be arranged round a lift shaft.

c) Exits shall not be used as a portion of a supply return or exhaust air system serving adjoining areas. Openings shall not be permitted in walls or in doors, separating exits from adjoining areas.

d) No flue chimney, electro mechanical equipment, air conditioning units, gas piping or electrical panels shall be allowed in the stairway.

e) Notwithstanding the detailed provision for exits in accordance with 4.2 and 4.3 the following minimum width shall be provided for staircases for Educational Occupancy 1.50 Mtrs.

5.3 EXTERNAL STAIRCASES : (Clause 4.4.2.4.3.4 of NBC -2016)

The external staircases are the staircases provided on the external wall/ façade and shall comply the following:

a) External stairs shall always be kept in sound and unusable condition.

b) All external stairs shall be directly connected to the ground

b) Entrance to the external stairs shall be separate and remote from the internal stair case.

c) Where an external staircase is provided it shall be ensured that the use of it at the time of fire is not prejudiced by smoke and flame from openings (For example window, doors) in the external face of the building. Care shall be taken to ensure that no external wall or window opening opens on to or close to an external stair. If such opening exits within 3 m from an external staircase, they shall be protected with fire rated doors/ window assemblies with rating of at least 60 min.

d) The external stairs shall be constructed of non combustible materials and any doorway leading to it shall have minimum 120 min fire resistance.

e) No external staircase shall be inclined at an angle greater than 45 degrees from the horizontal.

f) External stairs shall have straight flight not less than 1500 mm wide.

h) Handrails to be provided on both sides shall be of a height not less than1000 mm and not exceeding 1200 mm., there shall be provisions of balusters with maximum gap of 150 mm and the width of staircase is 1.50 Mtrs.

6. BASEMENT: (Clause 4.2.19 of PART IV AND CLAUSE 12.9 OF PART III OF NBC-2016)

Basement exits shall be sufficient to provide for the capacity of the basement as determined in accordance with 4.4.2.1. In no case shall there be less than two independent basement exits.

7.RAMPS: (Clause 4.4.2.4.3.5 Part IV of NBC -2016) Ramps with a width of 3.6 Mtrs and two way with(Minimum) 5.4 Mtrs.

8. FIRE FIGHTING SHAFT/ FIRE TOWER : (Clause 2.24 of Part IV of NBC -2016) An enclosed shaft having protected area of 120 Minutes fire resistance rating comprising protected lobby, staircase and fireman lift connected directly to exit discharge or through exit passageway with 120 min fire resistance wall at the level of exit discharge to exit discharge. These shall also serve the purpose of exit requirement strategy for the occupants. The respective floors shall be approachable from fire fighting shaft enabling the fire fighters to access the floor and also enabling the fire fighters to assist in evacuation through fireman's lift. The fire fighting shaft shall be equipped with firemen talkback, wet riser and landing valve in its lobby.

9) COMPARTMENTATION : (Clause 4.5 of Part IV of NBC -2016)

a) The maximum size of the compartment shall be as follows in case of sprinkled / Basement/ Building (Upper floors).

Sl.No	Use	Compartmentation Area M2
1	Basement Car Parking	3000
2	Basement(other than car Parking)	2000

b) **(Clause 4.5.2 of Part IV of NBC -2016**)

All floors shall be compartmented/zoned with area of each compartment being not more than 750 M^2

10) HORIZONTAL EXITS/REFUGE AREA : (Clause 5.1.4 and Annex E 6- of Part IV of NBC -2016)

The refuge area shall be provided on the periphery of the floor and open to air at least on one side protected with suitable railings.

2. Refuge area shall be provided at /or immediately above 24 Mtrs and thereafter at every15 mtrs or so.

3. One refuge floor at a height of 30.0 Mtrs shall be provided for safe evacuation with maximum of 2.5 Mtr floor height.

11) MINIMUM FIRE FIGHTING INSTALLATIONS FOR EDUCATIONAL BUILDINGS FOR ABOVE 30 MTRS AND UP TO 45 MTRS

1.	Fire Extinguishers **as per IS 2190: 2010**	Required
2.	Hose Reel **as per IS 3844:1985**	Required
3.	Down Comer **as per IS 3844: 1985**	Required
4.	Yard Hydrant **as per IS 13039: 1991**	Required
5.	Automatic Sprinkler System **as per IS 15105: 2002**	Required
6.	Manually operated Electric Fire Alarm System	Required
7.	Automatic Detection and Alarm System **as per IS 2189:2008**	Required
8.	Terrace Tank	20,000 Lts (30000 Ltrs in case of buildings having basement area 200 M2 and more)
9.	Underground Tank	1,50,000 Lts.
10.	At the Terrace Tank level with Minimum Pressure of 3.5 Kg/Cm2	900 LPM Booster pump (additional 900 LPM Booster pump required for every 2500 Sq Mtrs Built up area)
11.	Fire Pumps:	(02) Electric & (01) Diesel of 2850 LPM Capacity Pumps and 180 LPM capacity of Jockey Pump

12) ADDITIONAL SAFETY MEASURES FOR EDUCATIONAL BUILDINGS FOR ABOVE 30 MTRS AND UP TO 45 MTRS

a) SMOKE CONTROL OF EXITS : Clause 4.4.2.5 part IV of 2016 NBC -2016 to be complied.

b) PRESSURIZATION OF STAIR CASES: Clause 4.4.2.5(b) Table -6 & Clause E2 of Annexure -E part IV of 2016 NBC -2016 to be complied.

c) SERVICE DUCTS AND VERTICAL SHAFTS : Clause 3.4.5.4 part IV of 2016 NBC -2016 to be complied.

d) ESCAPE LIGHTING AND EXIT SIGNAGES : Clause 3.4.7 part IV of 2016 NBC -2016 to be complied.

e) EMERGENCY POWER FOR FIRE AND LIFE SAFETY SYSTEMS : Clause 3.6.4.6.2 part IV of 2016 NBC -2016 to be complied.

f) STANDBY POWER SUPPLY: Clause 3.4.6.4 part IV of 2016 NBC -2016 to be complied.

g) AIR CONDITIONING / VENTILATION AND SMOKE CONTROL :Clause 3.4.8 part IV of 2016 NBC -2016 to be complied.

h) FACADE/GLAZING BUILDING : As per Clause 3.4.10 part IV of 2016 NBC -2016 shall have to be complied.

i) SURFACE INTERIOR FINISHES : Clause 3.4.11 part IV of 2016 NBC -2016 to be complied.

j) ATRIUM : Clause 6 of Annexure-F part IV of 2016 NBC -2016 to be complied.

k) SERVER ROOMS/ COMPUTER LABS – FM-200 of equivalent standard shall be provided.

l) ELECTRICAL TRANSFORMER : As per Clause 3.4.6.3 part IV of 2016 NBC -2016 to be complied

M) ASSEMBLY /AUDITORIUM

1) The assembly / Auditoriums shall be restricted up to height 30 Mtrs as per NBC Part –IV of 2016.

2) The fire and life safety provisions shall be complied of Assembly Occupancy as per Part IV of NBC -2016.

13 ELECTRICAL EQUIPMENT

ELECTRICAL EQUIPMENT AND SAFETY RULES : (IS 14435:1997)

- **Clause 13.1** Transformer building / HT and LT control panels having aggregate oil capacity greater than 2000 Lts. Shall be housed in separate rooms / enclosures 6 m away, properly fenced.

- **Clause 13.2** Staircases and corridors lighting shall have separate circuits.

- **Clause 13.3** Miniature Circuit Breakers / Earth Leakage Circuit Breakers shall be provided in the circuits.

- **Clause 13.4** Earth connection shall be provided in buildings which are 15 m or more in height.

- **Clause 13.5** The lighting protection system for the building shall generally conform to IS 2309.

14. EMERGENCY AND ESCAPE LIGHTING : (IS 14435:1997)

- **Clause 15.1** Emergency lighting shall be powered from a source independent of that supplying normal lighting.

- **Clause 15.2** The emergency lighting shall be provided to be put on within second (preferably within 1 second) of the failure of the normal lighting supply.

- **Clause 15.3** Emergency lighting luminaries and their fitting shall be non-flammable.

- **Clause 15.4** It is essential that the wiring and installations of the emergency lighting systems are of high quality so as to ensure their perfect serviceability at all times.

- **Clause 15.5** The emergency lighting system shall be capable of continuous operation for a minimum duration of 1 h 30 min even for smallest premises.

- **Clause 15.6** It shall be ensured that the emergency lighting system is well maintained by periodical inspections and tests so as to ensure their perfect serviceability at all times.

- **Clause 15.7** Escape lighting shall be capable of;

    a. Indicating clearly and unambiguously the escape routes,

    b. Providing adequate illumination along such routes to allow safe movement of persons towards and through exit, and

    c. Ensuring that fire alarm call point and fire fighting equipments provided along the escape routes can be readily located.

- **Clause 15.8** Escape lighting luminaries shall be sited to cover the following locations;

    a) Near each intersection of corridors,

    b) At each exit door,

    c) Near each change of direction in the escape route,

    d) Near each staircase so that each flight of stair receives direct light

    e) Near any other change of floor level

    f) Outside each final exit and close to it

g) Near each fire alarm call point,

h) Near fire-fighting equipment, and

j) To illuminate exit and safety signs as required by the Enforcing authority.

Note : For the purpose of this clause "near" is normally considered to be within 2 m measured horizontally.

In IS 14435:1997 of Indian Standard Fire Safety in Educational Institutions – Code of Practice in Clause 13 Emergency and Escape Lighting

15. AIR CONDITIONING SYSTEM

Air conditioning system shall conform to clause D-1.17 of part IV and section 3 of part VIII of NBC of India. However, following points shall be ensured.

(a) Air ducts serving main floor areas, corridors etc, shall not pass through the staircase enclosures.

(b) Automatic fire dampers shall be provided in the ducts at the inlets of the fresh air and return air of each compartment / floor on every floor. The fire dampers shall be so arranged so as to close by gravity in the direction of the floor movement and to remain tightly closed automatically upon operation of smoke/heat detectors and signal transmittal to the fire alarm system.

(c) The air handling units shall be separate for each floor/each compartment at each floor level. The air ducts for every floor/compartment shall be separated and not interconnected with the ducting of any other compartment.

16 DISASTER MANAGEMENT (FIRE MANAGEMENT)

a) FIRE COMMAND CENTRE: As per Clause 3.4.12 part IV of 2016 NBC -2016 **:** Fire command Centre shall be on the entrance floor of the building having direct access. The control room shall have the main fire alarm panel with communication system (suitable public address system) to aid floors and facilities for receiving the message from different floors.

b) The command centre shall be constructed with 120 min rating walls with a fire door and shall be provided with emergency lighting. Interior finishes shall not use any flammable materials. All controls and monitoring of fire alarm systems, pressurization systems, smoke management systems shall happen from this room. Monitoring of integrated building management systems, CCTVs or any other critical parameters in building may also be from the same room.

c) Details of all floor plans along with the details of firefighting equipment and installations (2 sets laminated and bound) shall be maintained in fire command centre.

d) The fire staff in charge of the fire command centre shall be responsible for the maintenance of the various services and firefighting equipment and installations in coordination with security, electrical and civil staff of the building.

b) QUALIFIED FIRE OFFICER: As per Clause 4.10 part IV of 2016 NBC - 2016 **:** 4.10.1 A qualified fire officer with experience of not less than 3 years shall be appointed who will be available on the premises for large educational complexes.

4.10.2 The fire officer shall

a) Maintain the firefighting equipment in good working condition at all times

b) Prepare fire orders and fire operational plans and get them promulgated

c) Impart regular training to the occupants of the buildings in the use of firefighting equipment provided on the premises and keep them informed about the fire emergency evacuation plan

d) Keep proper liaison with the city fire brigade

e) Ensure that all the fire precautionary measures are observed at the times

C) FIRE SAFETY PLAN: As per Clause 4.11 Annex-D, D-5 part IV of 2016 NBC -2016.

D-5.1 A format for the fire safety plan shall be given in D-9.10

D-5.2 The applicable parts of the approved fire safety plan shall be distributed to all tenants of the building by the building management when the fire safety plan has been approved by the fire authority.

D-5.3 The applicable part of the approved fire safety plan shall then be distributed by the tenants to all their employees and by the building management to all their building employees.

D-5.4 In the event there are changes from conditions existing at the time the fire safety plan for the building was approved and the changes are such so as to require amending the fire safety plan, within 30 days after such changes, as amended fire safety plan shall be submitted to the fire brigade for approval.

D) BUILDING EVACUATION SUPERVISOR: The owner / occupier shall appoint a building evacuation supervisor for conducting and documenting results of periodical fire drills for compliance of timed egress provisions in the NBC.

E) FIRE DRILLS:- The drills shall be conducted once in every month and shall include the employees and staff members of all shifts . Fire drills shall include assignment of staff to close doors where necessary to prevent spread of smoke of fire, to search the lavatories or other rooms, to account for all occupants, to achieve prompt, quiet, orderly evacuation of the building or relocation to area of refuge.

F) INSURANCE: The builder shall duly insure all the occupiers of high rise educational institution including builing and equipment against all Disasters after obtaining No Objection Certificate for Occupancy from Fire Services Department.

G) MAINTAINANCE AND MANAGEMENT: High Rise Educational Institutions buildings shall be under the overall control and management of a single management body who shall be responsible for the fire and life safety. Maintenance shall comply with applicable standards and NFPA.

H) TRAINING : 40% of the occupants/ Employees should be got trained in fire prevention and fire fighting at A.P Fire Services And Civil Defence Training Institute, Sattenapalle, Guntur District before (06) Months for the occupancy fire NO OBJECTON CERTIFICATE.

I) LIABILITY AND RESPONSIBILITY AS PER AP FIRE ACT SECTION 19

a) The owner or occupier or both of a building or part thereof shall provide fire safety measures in it and maintain them in good repair and efficient condition at all times, in accordance with the building bye-laws.

b) The owner or Occupier or Management is personally responsible for any deviations of the stipulated safety precautions or non maintenance of the Fire safety equipments.

c) The Management shall pay compensation to the victims in case of any Fire accidents as prescribed by the Government.

Provided that, the owner, or occupier of the building or part thereof, the construction of which was completed on or before the date on which this Act comes into force or which was under construction on such date shall undertake and carry out such additional fire prevention and fire safety measures as required under the building bye-laws in force.

A.R.ANURADHA,
PRINCIPAL SECRETARY TO GOVERNMENT